

REMARKS

These remarks are in reply to the Office Action mailed January 25, 2006. As requested in the office action, claims 29, 30, 31, and 40 have been amended to clarify the antecedent basis of the sample area.

The Invention

The invention, as now presented in amended claim 21, is directed to a two-dimensional imaging optical instrument that includes a two-dimensional spatial detector and a two-dimensional variable filter having filter characteristics that vary in at least one dimension. The instrument defines a two-dimensional optical path that simultaneously conveys radiation from different positions in the sample area to different detector elements through portions of the spatial detector having different filter characteristics to produce variably filtered images. A spectral processor is operative to combine spectral information from the variably filtered two-dimensional images obtained as the two-dimensional sample area moves with respect to the instrument.

This mode of acquisition of variably filtered images acquired as a sample area moves with respect to the instrument allows the instrument to be easily retrofit to existing installations and does not require any moving parts, as stated in the application at page 7, lines 20-23. As a result, the instrument can quickly provide enhanced quality operations from a process without requiring any changes to the process equipment. And the lack of moving parts can help make the instrument inexpensive, easy to manufacture, and reliable to operate.

Claim 21 stands rejected as anticipated by Mao. Mao discloses a focal plane scanner having a front objective lens, a spatial window for selectively passing a portion of the image, and image sampling array means, such as a charge coupled device ("CCD") array, for receiving the passed portion of the image. The sole object of the invention listed in Mao's patent is to provide an improved image scanner that need not reside on a mobile platform that must move relative to a target image in order to accomplish scanning of that target image (col. 2, 42-48).

Clearly, therefore, Mao does not provide a spectral processor that is operative to combine spectral information from variably filtered two-dimensional images obtained from the spatial detector as the sample area moves with respect to the instrument, and he even teaches away from

such a concept. It is the sole objective of the Mao patent to create a scanning instrument that does not move with respect to the sample. More specifically, Mao begins his background section by presenting a disadvantage of prior art scanners with a moving camera over a target on the ground:

Airborne scanners are well-known in which a slit is placed in front of a charge-coupled device ("CCD") array in a camera and the moving aircraft then sweeps (scans) the slit past the ground-based image target in a so-called "push-broom" mode, thereby causing the large ground-based image to be scanned as the aircraft flies over the ground. Such scanners have the disadvantage that the airborne scanner platform must move with respect to the target in order to accomplish the scanning (col. 1, lines 31-39, emphasis added).

Mao then points out that a target can also be moved:

Other image scanning devices, such as flatbed scanners or drum scanners, are known in which the target image is moved past a scanning head so that the image can pass through optics and into a camera and/or onto a CCD array (col. 1, lines 40-43).

He then goes on to argue that all of these prior art devices require a large array or a scanning process that can produce relative movement that allows the entire image to be scanned:

In all such prior art devices, either the (one-dimensional or two-dimensional) CCD array must be large enough to receive the entire image at once or else the scanning process must move the target relative to the scanner so that the entire image can be scanned (col. 1, lines 44-48).

He also states clearly and unambiguously that his invention does not include a scanner on a mobile platform that moves past the target:

Unlike the present invention, the linear variable filter and CCD array are fixed with respect to the front objective lens, and the scanner must reside on a mobile platform and move past the target image in order to accomplish the scanning of the image (col. 1, line 65-col. 2, line 2).

He concludes his background section by reaffirming that it is desirable for the camera not to move relative to the target:

It is therefore desirable to have an improved image scanner that need not reside on a mobile platform that moves relative to a target image in order to accomplish scanning of that target image (col. 2, lines 3-6).

Mao never backs away from his criticism of relative motion between scanner and sample. One of ordinary skill in the art therefore would not be motivated to modify the Mao reference to reach the invention as now claimed in amended claim 21.

Claim 34 distinguishes over the prior art of record for at least reasons similar to those advanced in support of claim 21. The remaining claims are dependent and should be allowable for at least the reason that they depend on an allowable claim. Claims 42-48 are new, and their examination is respectfully requested.

This application should now be in condition for allowance, and a statement to this effect is respectfully requested. Should further questions arise concerning this application, the Examiner is invited to call Applicants' representative at the number listed below. The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment, to Deposit Account No. 50-0750.

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Respectfully submitted,

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